

Patent
Attorney Dkt.: LYNN/0153.A

IN THE SPECIFICATION

Please insert the following new paragraph directly after the title:

This application is a continuation of pending U.S. Patent Application No. 10/090,443, filed on March 4, 2002.

Please replace the paragraph extending from page 12, line 28 through page 13, line 6, with the following:

The metal membrane 46 separates hydrogen gas from other gaseous components or contaminants and splits the molecular hydrogen 26 into atomic hydrogen 26 32. The atomic hydrogen 26 32 diffuses through the membrane 46 to the outer surface 48 where the atomic hydrogen is adsorbed. The membrane structure is preferably supported on a matrix that imparts greater mechanical strength to the metal membrane. Most preferably, the support matrix is provided by the porous anode 24 and includes the necessary flow field or flow field/gas diffusion electrode arrangements to allow hydrogen to be distributed evenly across the face of the anode.

Please replace the paragraph at page 13, lines 13-19, with the following:

Preferably, the metal membrane is made from palladium alloys, where the palladium concentration varies from 100 wt% to 5 wt% and the alloying metal is a transition metal, main group metal (sp), or a combination thereof. The most preferred metal membrane is made from a palladium silver alloy 75:25 wt% Pd:Ag. Furthermore, body-centered cubic refractory metals, such as ~~Zirconium~~ zirconium, niobium, tantalum, and vanadium, having significantly higher bulk hydrogen permeability than palladium, can be used as a direct replacement for palladium.

Please replace the paragraph at page 14, lines 10-13, with the following:

Optionally, the metal membrane system will incorporate an ammonia generating catalyst to act as the electrode on the outer surface 48 of the membrane 46 facing the electrolyte 12 (See Figure 2). The hydrogen atoms diffuse through the metal membrane layer onto the ammonia catalyst

Patent
Attorney Dkt.: LYNN/0153.A

surface where they react with the adsorbed nitrogen atoms.

Please replace the paragraph at page 19, lines 1-10, with the following to add a period at the end of the paragraph:

All electrochemical measurements were performed versus a lithium/lithium ion reference electrode. The electrochemical cell was assembled in the glove box with the fuel cell type anode and cathode electrodes positioned with the active sides facing each other. The cathode was a sintered nickel gas diffusion electrode and the anode was a palladium metal membrane hydrogen separator. The cell was removed from the glove box and connected to the appropriate gas stream. Nitrogen was used for the cathode and hydrogen for the anode. Argon was used to provide an inert substitute for the reactive gases for background measurements. The current potential curves were recorded using an EG&G Parc Model 175 Universal programmer and an EG&G Model 371 Potentiostat-Galvanostat.